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Product Note No 3

The MTS Power Amplifier Design Work Station

The MTS rf-PADS is an IBM®-PC based **Load Pull and Power Amplifier Design Work Station**. It permits to Design Engineers to measure active devices (FETs, bipolar transistors) in the frequency range 0.8 to 3 GHz (option 4.2 GHz) for up to 75 W CW power and use the Load Pull data to design high power wide band amplifiers stages. Pulsed power operation is also possible.

The MTS rf-PADS Work Station includes the following components:
- A complete MTS Load/Source Pull tuner system and
- The rf-PADS Power Amplifier Design Software option.

Operation

Transistor Measurement: The user has to define the transistor, bias, input power and frequency range of operation.
The MTS system, including tuners, test fixture and all passive components of the setup, has to be calibrated on a Network Analyzer and the calibration files saved on hard disk. The Network Analyzer is no longer needed for the Work Station operation. The transistor is inserted in the fixture and Load Pull contours are measured over a defined frequency range.

After the measurement is terminated the software **automatically steps** through the frequency range and generates **rf-PADS** compatible Power Contour files for automatic data transfer.

Amplifier Design: The user has to define a network description file (.CKT) using the familiar Touchstone® format, for the input and output networks of the desired amplifier. Then he can retrieve the contour data from disk and **optimize** the components of the .CKT file to obtain **simultaneously**,
a) **Minimum input reflection**.
b) **Constant output power**.
rf-PADS includes the following Circuit Elements: R,L,C,MTRL and Twoports.
These elements are sufficient for designing up to 4 GHz.
Since rf-PADS uses contours, instead of discrete impedance points, convergence of the optimization, especially at the output, is extremely fast. A typical design process can be less than 1/2 hour. The optimization itself converges within a few minutes (using a standard 80386/33 MHz PC with 80387 co-processor).
Typical accuracy up to 4 GHz is **±0.2 dB** or better for the **first iteration**.

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